SALMON 2008 Preproposal Conference

Science Evaluation and Selection Process

Paul Hertz
Chief Scientist, Science Mission Directorate, NASA

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Outline

SALMON AO (NNH08ZDA009O)

- Major AO Requirements for Science and Science Implementation
- Science Evaluation Process
- Science and Science Implementation Evaluation Criteria
- Selection Process and Factors

ROSES NRA (NNH08ZDA001N)

- Major NRA Requirements
- Evaluation Process
- Evaluation Criteria
- Selection Process and Factors

AO Science Requirements

- **Scope**: Investigations must require spaceflight and must result in archived data and peer reviewed publications
- **Relevance**: Science objectives for the proposed investigation must be relevant to (i) NASA strategic goals and (ii) the science goals of the PEA
- **Traceability**: Scientific goals, objectives, and measurements that define the investigation must be explicitly stated
  - Flowdown from investigation goals to measurement objectives and payload performance and mission design must be stated clearly and supported by quantitative analysis where possible
  - Required “science objectives-to-measurements-to-mission traceability” may be provided either in narrative or tabular form

AO Science Requirements: Data

- **Data Rights**: Data must be made fully public, in a useable form, as soon as possible
  - No proprietary data period, only brief period for validation
  - Data must be deposited in appropriate NASA data archive
  - All necessary ancillary data must be collected and archived
- **Data Sharing**: For Partner MOs, prior to confirmation an appropriate data sharing agreement must be negotiated
  - NASA expects mission data beyond NASA-funded instrument will be archive in a NASA data archive
- **Data Analysis**: Must discuss data analysis explicitly and how this will meet the science objectives
  - Data quality required and how mission will yield
  - Data quantity expected and how mission will provide
  - Data analysis and archiving plan including (i) quantitative analysis that data quality and quantity are sufficient and (ii) demonstration that budget and schedule are sufficient

AO Science Requirements: STEO

- **STEO**: Science or Technology Enhancement Option
  - E.g. extended investigations, guest investigators, archival data analysis programs, etc.
  - Baseline investigation must accomplish proposed science goals
  - Options beyond baseline may be proposed
  - Cost for STEO will not count against the PI Mission Cost
  - NASA might not select STEO at this time
  - NASA might require additional reviews (e.g. Senior Review)
  - NASA might want to select the participants

AO E/PO Requirements

- **E/PO**: Education and Public Outreach
  - Optional – no E/PO requirement, no minimum, no maximum
  - Brief overview and relationship to mission only
- **SC**: Student Collaboration
  - Optional – no SC requirement, is a component of E/PO
  - Must directly involve higher education students (undergraduate, graduate) in a spaceflight experience
  - Must be separable from mission, implemented on non-impact basis
  - Must include plan for mentoring and oversight of students
  - Must provide details of development plan
  - Not required to add value to the mission objectives
- **Evaluation**: Overall merit will be separately evaluated
  - Not part of Categorization
  - May be considered at Selection

AO Cost Requirements

- PI Mission Cost is the cost to the Program of the portion of the mission that is under PI management responsibility
  - Each PEA has a cap on PI Mission Cost
- An adequate unencumbered reserve on PI Mission Cost is measured against the cost to complete through Phases A/B/C/D and is a minimum of 25% not including funded schedule reserve
  - Adequate reserves required in Phases E/F but no minimum specified
  - Adequate funded schedule reserves required but no minimum specified

AO Management Requirements

- Principal Investigator (PI) led investigations
  - PI team may use own management procedures and methods
- Emphasize investigation success within cost and schedule
  - Incorporate sufficient margins, reserves, and resiliency
  - Risk management critical
  - Consider all possible options for avoiding cost growth including descopes
- Non-US partners and contributions introduce complexity and risk as well as benefits
  - Show understanding of risk
  - Show possible risk mitigations
  - Show understanding of export control regulations
- Co-investigator must define role and identify funding
  - Plays necessary role
  - Must commit through NSPIRES

AO Highlights : International Participation

- International participation adds management complexity and risk
  - Includes risk of problems beyond PI's control
  - Cooperative arrangements should offer significant benefits
  - No-exchange-of-funds basis
- Letters of endorsement are required
  - Funding agency endorsement required if applicable
- Must describe how export laws will be complied with
  - During Phase A and Phases B/C/D/E
  - See separate export control presentation

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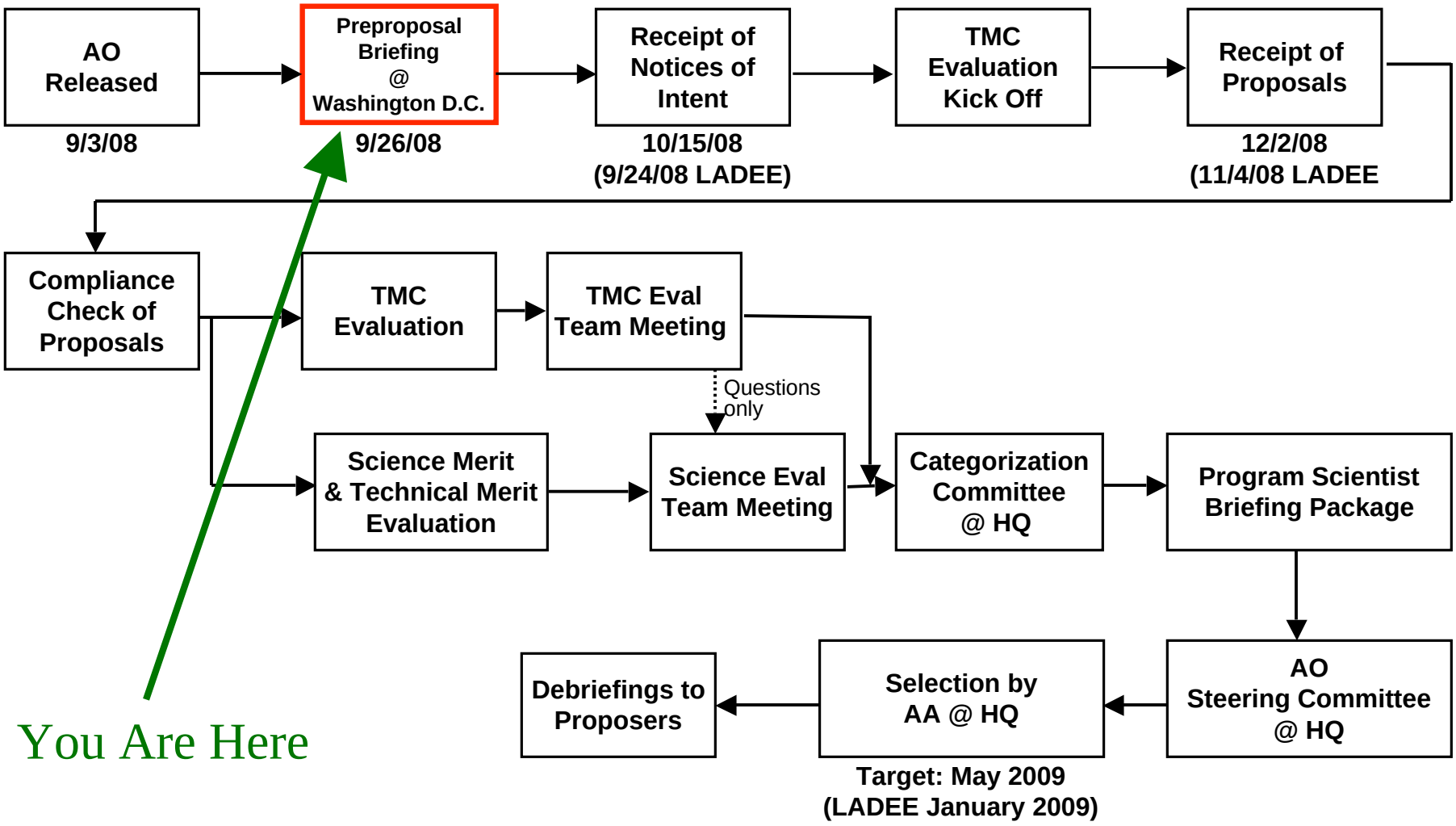
Proposal Evaluation Process



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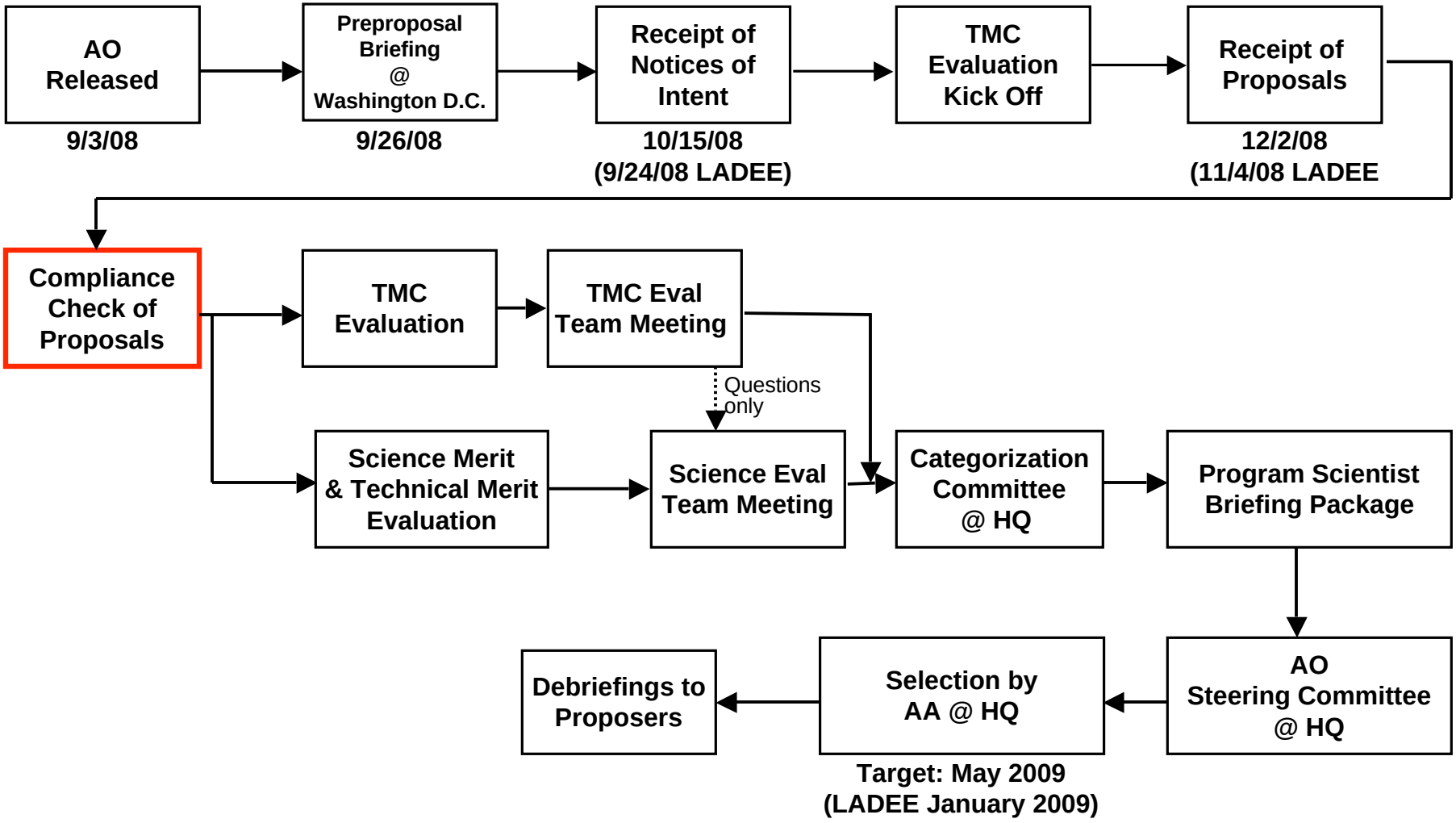

Compliance Check (Appendix F)

- Proposals received and screened for compliance with AO
  - Proposal received on time (signed original, 55 copies, CD)
  - Complete, meets general format requirements, and within page limit (one volume, satisfies Appendix B, only required appendices, budget files in correct formats)
  - Science goals and objectives within solicited science disciplines
  - Includes flowdown, archiving, descope options, data analysis
  - Single PI, complete investigation proposed, meets MO category requirements
  - Cost within cap (PI mission cost, Phase A cost), includes Co-I costs
  - Launch or commitment date prior to cutoff (see PEA)
  - E/PO, SDB subcontracting, etc. commitment
  - CO-I commitments through NSPIRES
  - Letters of Endorsement (organizations offering goods/services, major participants, launch service provider if not NASA, non-NASA funding agencies)
  - Table describing non-US participation

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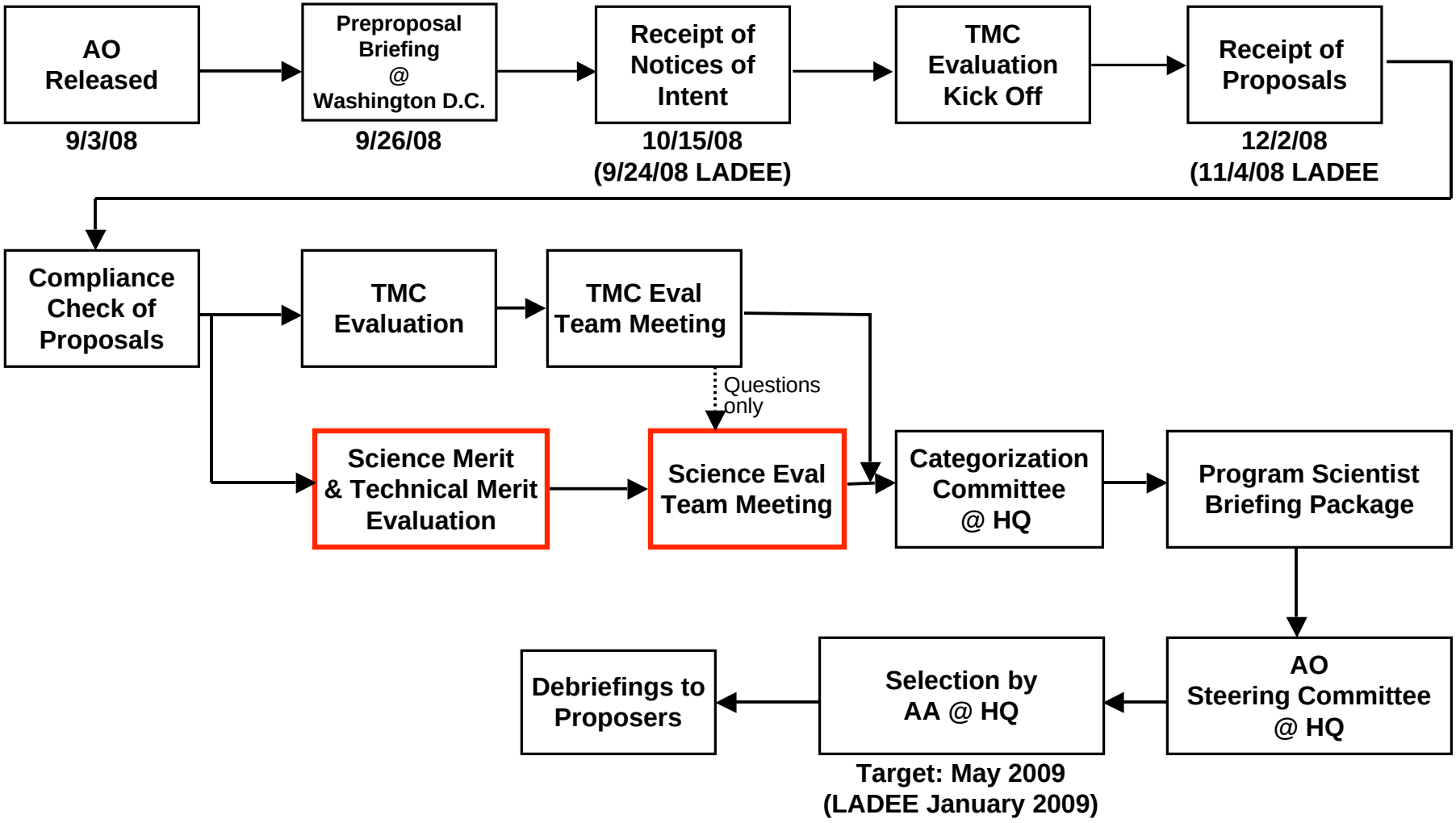

Evaluation Process

- Scientific/Technical Peer Panels
  - Assigned to science panel based upon PEA (if subpanels required, based upon science, science instrumentation, and technology proposed)
  - Panels formed with expertise in scientific topic areas and science instrumentation
  - Conflict of interest avoided

- Proposals reviewed in depth for (A) scientific merit and (B) implementation merit and feasibility
  - Major/minor strengths and weaknesses identified and recorded
  - Evaluation criteria assigned an adjectival rating (Excellent, Very Good, Good, Fair, Poor) based on findings
  - Summary rationale provided

Evaluation Process (continued)

- Technical, Management, and Cost (TMC) Feasibility Panels
  - Managed by Science Support Office at Langley Research Center
  - See next presentation

- Note: for PEA H3, Small Complete Missions of Opportunity in Astrobiology and Fundamental Space Biology, the TMC feasibility review is replaced by an Accomodation Study
  - Managed by the Program Office at Ames Research center

Evaluation Criteria: Scientific Merit

- To evaluate the Scientific Merit of the proposed investigation, the following factors will be considered:
  - Impact of the investigation on NASA's research programs and on the U.S. space science program
  - How well the investigation
    - fills gaps in the understanding of science
    - provides progress in NASA's science research programs
    - synergistically supports ongoing science missions
    - provides ancillary benefits to U.S. science program
  - Sufficiency of data to complete the proposed investigation
- Scientific merit based on
  - The proposed NASA funded investigation, not the entire host mission (where relevant)
  - The baseline investigation, not the minimum investigation or the enhanced investigation

Evaluation Criteria: Implementation Merit & Feasibility

- To evaluate the Implementation Merit of the investigation, the following factors will be assessed:

  Includes feasibility, resiliency, and probability of success.

  – Will the proposed investigation address the goals and objectives.
  – Can the proposed instrument(s) be built as proposed.
  – Will the proposed mission support acquisition of the necessary data.
  – Plan for completing required technology development and likelihood of success.
  – Merit of the proposed calibration/validation, data analysis and archiving plan including budget adequacy; merit of the proposed plan for timely release of data to the public domain.
  – Potential of STEO to enhance science; impact of STEO evaluation on overall score of this criterion will be provided to NASA
  – Probability of success based on (i) experience, expertise, and organization of science team and on (ii) technical risk associated with mission design and instrument set.
  – Necessary contribution of each co-investigator.

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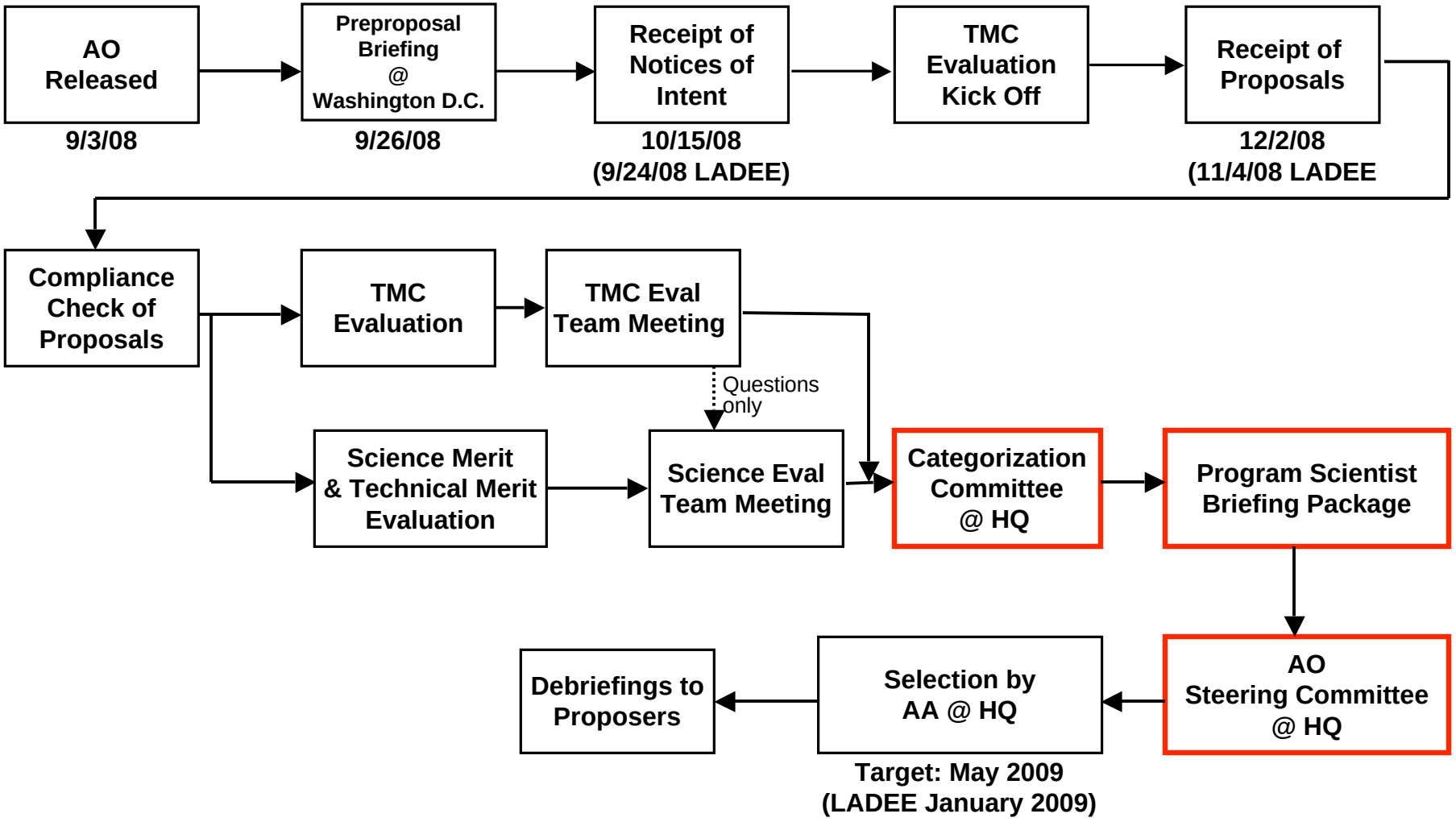

Categorization (§7.1)

- Category I. Well conceived and scientifically and technically sound investigation pertinent to the goals of the program and the AO's objectives and offered by a competent investigator from an institution capable of supplying the necessary support to ensure that any essential flight hardware or other support can be delivered on time and that data can be properly reduced, analyzed, interpreted, and published in a reasonable time. Investigations in Category I are recommended for acceptance and normally will be displaced only by other Category I investigations.
- Category II. Well conceived and scientifically or technically sound investigations which are recommended for acceptance, but at a lower priority than Category I.
- Category III. Scientifically or technically sound investigations which require further development. Category III investigations may be funded for development and may be reconsidered at a later time for the same or other opportunities.
- Category IV. Proposed investigations which are recommended for rejection for the particular opportunity under consideration, whatever the reason.

In response to AOs, NASA usually selects and funds only Category I investigations.

Evaluation Criteria

- Scientific merit of the proposed investigation [40%]
- Implementation merit and feasibility of the proposed investigation [30%]
- Technical, management, and cost (TMC) feasibility, including cost risk, of the proposed investigation [30%]
  - Weights are for categorization
- Comments on the "core" E/PO element and overall merit of the Student Collaboration will be evaluated, but will not be included in the overall merit of the proposal and will not be a factor in the categorization of the proposal

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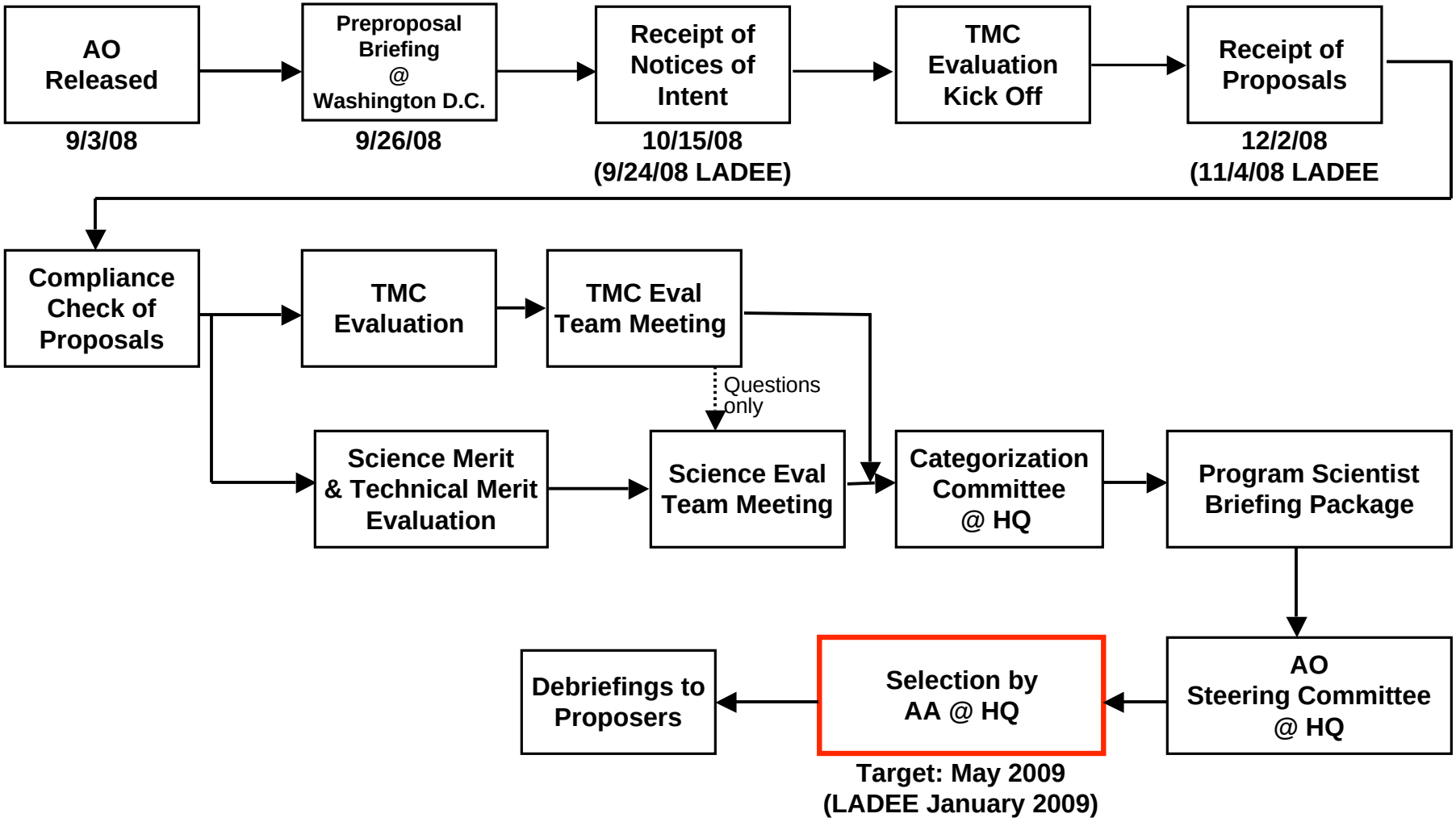
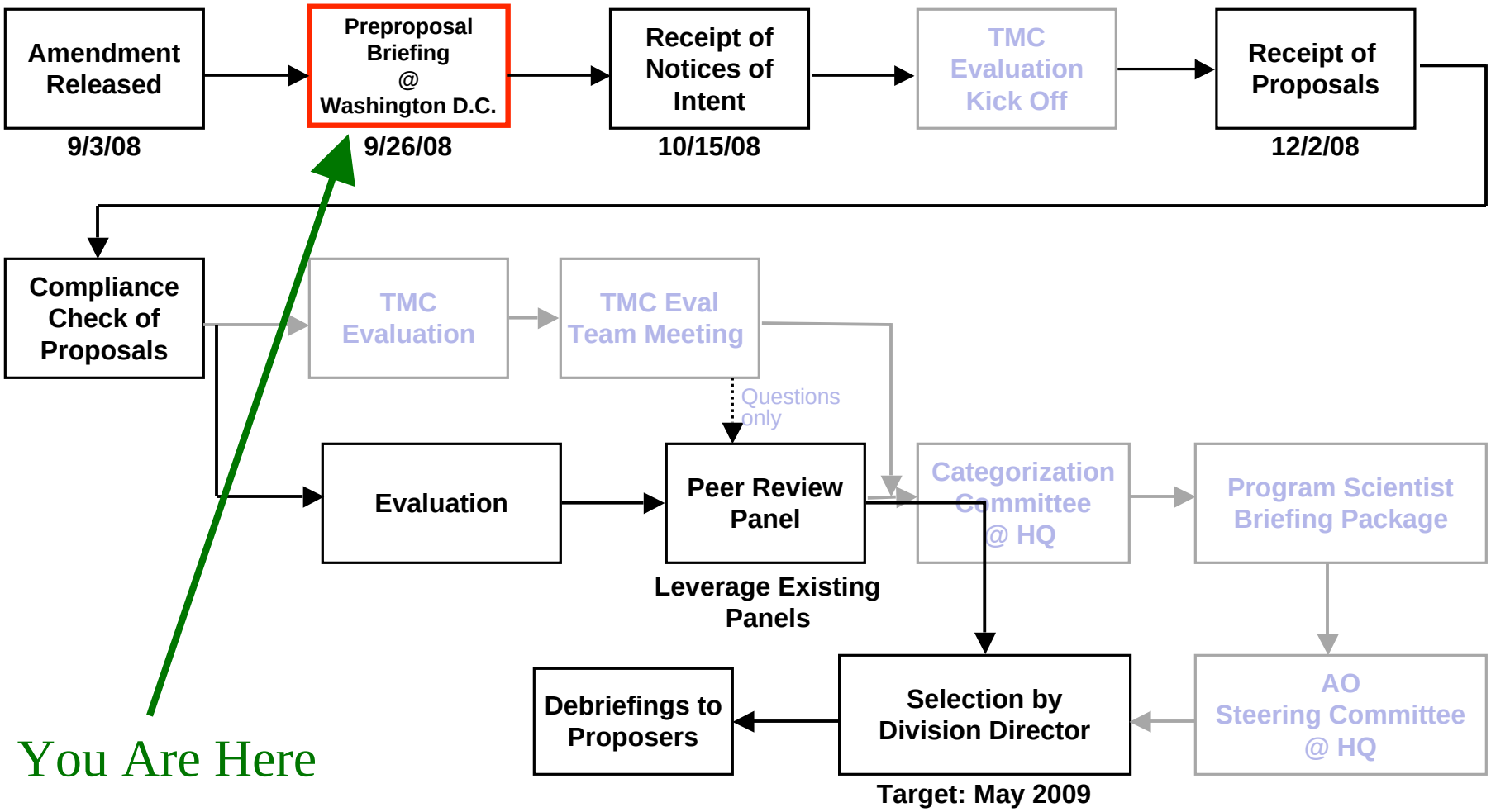


Selection (§7.3)

- Selection Factors
  - Proposal evaluations based on published criteria
  - Categorization
  - Cost to NASA Program
  - Programmatic factors including available funding and programmatic balance
- Overriding consideration: Maximize scientific return and minimize implementation risk within the available budget
  - Science program is an evolving activity; selecting official will use all available science planning, policy, and cost considerations
- Select
  - H2 Planetary PMO: One or more for <$35M total
  - H3 Astrobiology SCM: One or more for <$1-2M total
  - H3 Fund Space Biology SCM: One or two for <$1.5M
  - H5 LADEE FMO: One for <$5M

ROSES 2008 USPI Elements
Proposal Evaluation Process



ROSES Proposal Requirements

- As specified in the Guidebook for Proposers (just like any other ROSES proposal)
  - The objectives and expected significance of the proposed research, especially as related to the objectives given in the NRA;
  - The technical approach and methodology, including a description of any hardware proposed;
  - The perceived impact of the proposed work to the state of knowledge in the field;
  - The relevance of the proposed work to past, present, and/or future NASA programs and interests or to the specific objectives given in the NRA;
  - A general plan of work, including anticipated key milestones for accomplishments, the management structure for the proposal personnel, and a description of the expected contribution to the proposed effort by the PI and each person regardless of whether or not they derive support from the proposed budget;
  - A data archiving plan.

ROSES Evaluation Criteria

- Relevance to NASA's objectives includes
  - the potential contribution of the effort to NASA's mission
  - the potential contribution of the effort to the specific objectives and goals given in the solicitation to which the proposal is submitted.
- Intrinsic merit includes
  - Overall scientific or technical merit of the proposal and/or unique and innovative methods, approaches, concepts, or advanced technologies demonstrated by the proposal;
  - Offeror's capabilities, related experience, facilities, techniques, or unique combination of these;
  - The qualifications, capabilities, and experience of the proposed principal investigator, team leader, or key personnel; and
  - Evaluation against the state-of-the-art.
- Cost of a proposed effort includes
  - the realism and reasonableness of the proposed cost
  - the comparison of that proposed cost to available funds

Helpful Hints

- Read the AO or NRA carefully and follow all instructions
- Your audiences are the science and TMC peer review
- Science peer review panel
  - Out of all the excellent science investigations that are proposed, why is yours the one that should be selected? Why is your investigation the best way to achieve your science objectives?
- TMC peer review panel
  - How will you accomplish your science objectives within the proposed resources? Why do you believe that you can accomplish your science objectives within the proposed resources?

Guidelines for Science Section

- Describe scientific objectives, identify primary science research program, describe value of investigation to the strategic objectives of the program.
- Discuss scientific products, discuss measurements to be taken and data to be returned, discuss how products and data will fulfill scientific objectives.
- Discuss science implementation, discuss how instruments and mission will deliver the required data.
- Discuss how data will be obtained, identify approach leading from data to science objectives, discuss plan for delivery of data products, identify individuals responsible.
- Describe history and basis for proposal, note relationships to other missions, provide overview of mission.

Guidelines for Science Section

- Describe science implementation, including
  - Instrumentation: describe instrumentation, criteria for selection, individual instruments and heritage, characteristics and performance, block diagrams, interfaces, etc.
  - Mission: observing strategy, spacecraft performance, mission concept, etc.
  - Data Analysis and Archiving: data reduction and analysis plan, method and format, data products, schedule to NASA archive.
  - Science Team: members, roles, responsibilities.
- Science requirements should flow down to everything else.

Proposal Science Requirements

- Science Team Responsibilities
  - Role of leaders and every team member; difference between co-investigator and collaborator.
  - Initial analysis of data, delivery to an appropriate data repository, publication of scientific findings, and communication of results to the public.
  - Release data as soon as possible (after appropriate brief validation period).
  - Collect scientific, engineering, and ancillary information necessary to validate and calibrate scientific data.
  - Implement E/PO program.

Primary Resources

- The SALMON AO NNH08ZDA009O
  - http://nspires.nasaprs.com/external/
- The SALMON Program Library
  - http://salmon.larc.nasa.gov/SALMONreflib.html
- The SALMON Acquisition Additional Information Page
  - http://salmon.larc.nasa.gov/
- Technical Points-of-Contact
  - Points of Contact (see Library documents)
- The SALMON Program Officer
  - salmonao@nasa.gov
- The SALMON PEA Points-of-Contact
  - Points of Contact (see last page of PEA)